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SODIUM IN FOODS

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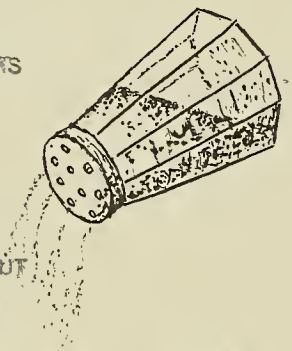

Excessive intake of sodium is now one of the foci of medical interest. Physicians counsel patients on the possible relationship between excessive sodium (salt) consumption and hypertension. They urge decreased sodium intake, especially for those vulnerable, including cardiac and hypertensive populations (3). The Food and Drug Administration has stated that one of its priorities is to find ways to lower the sodium content of processed foods and to educate the public concerning excessive use of sodium (5,7).

The Recommended Daily Dietary Allowance for sodium for adults is 1100-3300 milligrams per day (1.1-3.3 grams) (6). This amount is equivalent to about 3 to 8 grams of sodium chloride, common table salt.

Small quantities of sodium occur naturally in many unprocessed or raw food products. During processing manufacturers add salt (usually sodium chloride) for flavor as in canned vegetables or soups, or as part of a preservative process, as in prepared meats and fish not destined to be canned. In products containing hydrolyzed vegetable protein, large quantities of salt may be present. Salt is formed if the protein is hydrolyzed with acid and the acid is neutralized with alkali.

In this Bulletin we report on the sodium content of some common foods and compare products purporting to be low in sodium with the ordinary products usually not making any claim. When possible we obtained the same brand for both types of product and selected products which would show the range of sodium intake for like products with dissimilar claims for sodium. This information allows consumers to make informed judgements on how much salt they consume and which type of product to purchase.

Methods

Samples were collected in food stores in Connecticut in February, June, and August, 1981. When required, samples were refrigerated for transport to the laboratory and then either refrigerated or frozen until analyzed. Samples were ground (as with crackers) or blended (as with canned vegetables) before analysis. Data for sodium in cottage cheese are from Bulletin 791 of this Station (4). Sodium was determined by Atomic Absorption Spectrophotometry (1).

Results and Discussion

The amount of sodium claimed on the label per 100 grams of product and the amount found by analysis is shown in the Table. For some of the foods examined the amount of sodium per 100 grams was not stated on the label but all showed the amount of sodium in a serving. There are no labelling requirements for ordinary products, but many of those collected stated on the labels the amount of sodium per serving.

Since consumers purchase for dietary reasons foods purporting to be low in sodium (generally labelled as low sodium, no salt added, salt-free, or "for sodium-restricted diets") we show in the Table, where applicable, the percentage of sodium in the low-salt product compared with the ordinary product. Overall, percentages ranged from a low-salt product with 98% less sodium than the ordinary product to one with only 5% less sodium than the ordinary product. In two cases, spaghetti and melba toast, the amount of sodium in the low-salt product was greater than in the ordinary product. The actual

Product, brand, label	Sodium mg/100g claim	Sodium mg/100g found	Percent sodium in low sodium product compared to ordinary product	mg sodium/serving
Baby food, Jr. beef meat dinner with vegetables, Gerber, NSA	-	65	72	83 / 4-1/2 oz.
Baby food, Jr. beef meat dinner with vegetables, Gerber	-	90		115 / 4-1/2 oz.
Beans, canned, cut green, Featherweight, NSA	10	80	22	91 / 1/2 cup
Beans, canned, cut green, Shop Rite	360	360		817 / 1 cup
Beans, canned, cut wax, Featherweight, NSA	10	95	36	108 / 1/2 cup
Beans, canned, cut wax, Shop Rite	-	265		602 / 1 cup
Beets, canned, sliced, Featherweight, NSA	45	70	39	80 / 1/2 cup
Beets, canned, sliced, Shop Rite	-	90		204 / 1 cup
Bread, enriched, Reynolds, low sodium, NSA	-	30	4	17 / 2 slices
Bread, enriched, Reynolds Sunbeam	-	725		411 / 2 slices
Bread sticks, Stella D'Oro for sodium restricted diets	20	133	33	34 / 3 pieces
Bread sticks, Stella D'Oro	-	405		104 / 3 pieces
Broth, beef, instant, Herb-ox, low sodium	250	365	9	15 / 4 grams
Broth, beef, instant, Herb-ox	-	4220		190 / 4.5 grams
Butter, sweet, whipped, Land O'Lakes, unsalted	-	35	23	3 / 1 tbsp.
Butter, sweet, whipped, Land O'Lakes, slightly salted	-	155		14 / 1 tbsp.
Cake mix, pound, Diamel, reduced sodium	293	365	94	83 / 1/10th cake
Cake mix, pound, Betty Crocker	380	390		147 / 1/12th cake
Candy, chocolate crunch, Estee, low sodium, NSA	95	85	59	12 / 14 grams
Candy, chocolate crunch, Nestle	-	145		20 / 14 grams
Carrots, canned, sliced, Featherweight, NSA	25	50	10	57 / 1/2 cup
Carrots, canned, sliced, Shop Rite	-	250		568 / 1 cup
Catsup, Diamel, imitation, NSA	-	100	10	14 / 1 tbsp.
Catsup (Ketchup), Heinz	-	960		134 / 1 tbsp.
Cereal, corn flakes, Van Brode, low sodium, NSA	25	105	56	30 / 1 oz.
Cereal, corn flakes, Kelloggs	-	186		53 / 1 oz.
Cheese, New York cheddar, Heluva Good, salt free	-	380	92	216 / 2 oz.
Cheese, New York, washed curd, Heluva Good	-	415		236 / 2 oz.
Cheese, cottage, Axelrod's, dry curd, NSA	29	46	15	52 / 1/2 cup
Cheese, cottage, Axelrod's, dry curd, NSA	29	125		142 / 1/2 cup
Cheese, cottage, Axelrod's, lowfat	-	576		654 / 1/2 cup
Cheese, cottage, Axelrod's, lowfat	-	695		789 / 1/2 cup
Cheese, cottage, Breakstone's, dry curd, NSA	55	53	11	60 / 1/2 cup
Cheese, cottage, Breakstone's, dry curd, NSA	55	66		75 / 1/2 cup
Cheese, cottage, Breakstone's, dry curd, NSA	55	54		61 / 1/2 cup
Cheese, cottage, Breakstone's, lowfat	-	644		731 / 1/2 cup
Cheese, cottage, Breakstone's, lowfat	-	412		468 / 1/2 cup
Cheese, cottage, Friendship, lowfat, NSA	-	94	33	107 / 1/2 cup
Cheese, cottage, Friendship, lowfat, NSA	-	305		346 / 1/2 cup
Cheese, cottage, Friendship, lowfat	-	614		697 / 1/2 cup
Cheese, cottage, Friendship, lowfat	-	450		511 / 1/2 cup
Corn, canned, whole kernel, Featherweight, NSA	10	35	14	40 / 1/2 cup
Corn, canned, whole kernel, Shop Rite	-	250		568 / 1 cup
Corn chips, Health Valley, unsalted	5	20	6	11 / 2 oz.
Corn chips, Planters	-	545		310 / 2 oz.
Crackers, A & P, unsalted tops	-	830	62	254 / 10 crackers
Crackers, saltines, A & P	-	1345		382 / 10 crackers
Crackers, saltines, Edwards	-	1110		315 / 10 crackers
Crackers, Food Club, unsalted tops	-	920		261 / 10 crackers
Crackers, saltines, Grand Union, unsalted tops	-	670	74	190 / 10 crackers
[illegible]	-	[illegible]	[illegible]	[illegible]

Crackers, saltines, Pathmark, unsalted tops	-	655	52	186 / 10 crackers
Crackers, saltines, Pathmark	-	1265		359 / 10 crackers
Crackers, saltines, Shop Rite, unsalted tops	-	785	69	223 / 10 crackers
Crackers, saltines, Shop Rite	-	1140		324 / 10 crackers
Crackers, saltines, Stop & Shop, unsalted tops	-	665	75	189 / 10 crackers
Crackers, saltines, Stop & Shop	-	890		253 / 10 crackers
Crackers, Sunshine Krispy, unsalted tops	-	700	63	199 / 10 crackers
Crackers, saltines, Sunshine	-	1115		317 / 10 crackers
Crackers, Nabisco, unsalted tops	-	845	95	240 / 10 crackers
Crackers, saltines, Nabisco	-	885		251 / 10 crackers
Fish, Tuna, chunk white in water, Chicken of the Sea, low sodium	50	125	24	12 / 3-1/4 oz.
Fish, Tuna, solid white in water, Chicken of the Sea	-	527		60 / 7 oz.
Juice, vegetable, Campbell's V-8, low sodium	30	10	5	20 / 6 fl. oz.
Juice, vegetable, Campbell's V-8	10	220		440 / 6 fl. oz.
Margarine, sweet, Mazola, unsalted	1	45	15	6 / 1 tbsp.
Margarine, Mazola	815	305		43 / 1 tbsp.
Mayonnaise, Balance, prepared without salt	26	10	3	10 / 1 tbsp.
Mayonnaise, Hellmann's	-	360		1360 / 1 tbsp.
Melba Toast, Devonshire, unsalted rye	16	55	+57	2 / 1 slice
Melba Toast, Devonshire	-	35		2 / 1 slice
Peanut Butter, chunky, Erewhon, unsalted	-	30	19	9 / 2 tbsp.
Peanut Butter, chunky, Erewhon, salted	-	155		44 / 2 tbsp.
Peanuts, dry roasted, Planter's, unsalted	<10	20	4	6 / 1 oz.
Peanuts, dry roasted, Planter's	-	485		138 / 1 oz.
Peanuts, dry roasted, Sweet Life, unsalted	-	171	27	49 / 1 oz.
Peanuts, dry roasted, Sweet Life	-	625		178 / 1 oz.
Peas, canned, Tillie Lewis, NSA	10	110	30	125 / 1/2 cup
Peas, canned, Del Monte	-	365		829 / 1 cup
Potato chips, Hain, unsalted	-	150	36	43 / 1 oz.
Potato chips, State Line, NSA	-	60	10	17 / 1 oz.
Potato chips, State Line	-	595		169 / 1 oz.
Potato chips, Wise	-	420		19 / 1 oz.
Pretzels, Featherweight, Low Sodium, NSA	90	25	2	7 / 1 oz.
Pretzels, Reisman	-	1490		423 / 1 oz.
Ravioli, canned, beef in sauce, Diamel, NSA	45	60	15	136 / 8 oz.
Ravioli, beef, Chef Boy-Ar-Dee	-	405		863 / 7 1/2 oz.
Rice cakes, organic Arden, NSA	<10	40	9	3 / 1 cake (7.6 g.)
Rice cakes, plain, Arden	37	430		33 / 1 cake (7.6 g.)
Soda, seltzer, Stop & Shop, NSA	-	25	71	7 / 1 cup
Soda, club, Stop & Shop	-	35		10 / 1 cup
Soup, tomato, Campbell's, low sodium, NSA	20	65	11	134 / 7 1/4 oz.
Soup, tomato, Campbell's	-	605		859 / 5 oz.
Soup, vegetable, Campbell's, low sodium, NSA	25	45	9	93 / 7 1/4 oz.
Soup, vegetable, Campbell's	-	515		731 / 5 oz.
Spaghetti, enriched, thin, Prince, NSA	<10	30	+20	17 / 2 oz. dry
Spaghetti, enriched, thin, Mueller's	-	25		14 / 2 oz. dry
Spaghetti sauce, Diata, no salt	59	55	31	62 / 1/2 cup
Spaghetti sauce, Palmieri	-	175		199 / 1/2 cup
Vegetables, mixed, canned, Featherweight, NSA	20	45	11	51 / 1/2 cup
Vegetables, mixed, canned, Shop Rite	-	410		931 / 1 cup

1 NSA = No salt added

2 mg = milligrams g = grams

3 Serving unit size usually obtained from label

4 a dash (-) indicates no claim on label

5 For calculations 1 ounce (oz.) = 28.4 grams
1 cup (c.) = 8 ounces or 227 grams
1/2 cup (1/2 c.) = 4 ounces or 113.5 grams

6. Tbsp. = tablespoon

amounts per 100 grams of product, however, were small. The crackers with unsalted tops averaged about 31% less sodium than saltines with salted tops, but the range was wide, varying from 5 to 48%.

Thirty-six samples made a claim on the label for milligrams sodium per 100 grams of product. Only 44% were found to be within 20% of the claimed amount. In some of these examples the product contained less than 100 milligrams sodium per 100 grams, an amount probably not excessive except for those on the strictest low-sodium regimens.

Milligrams of sodium per serving of the particular food are also shown in the Table. Note that serving sizes are not always comparable between low-salt and ordinary products since the serving size was usually obtained from the label. For example, in canned beans, beets, carrots, peas, corn, and mixed vegetables, the serving size for the low sodium product is one-half cup and for the ordinary product it is one cup. The serving size for low-sodium tuna fish was stated as being about one-half that of ordinary tuna fish. For low-sodium pretzels the serving size was listed as 5 grams, about one-sixth of an ounce. We considered this to be unrealistic and calculated the sodium in 28.4 grams, a one-ounce serving.

The sodium content of table salt (sodium chloride) is about 39%. Thus, to approximate how much common table salt a product contains the milligrams of sodium per 100 grams is multiplied by 2.5. This value divided by 1000 will give the percentage of salt in the food. For example, in ordinary bread, 725 milligrams sodium per 100 grams times 2.5 divided by 1000 equals 1.8% salt. For regular beef broth 4220 milligrams sodium per 100 grams times 2.5 divided by 1000 equals 10.6% salt.

Summary

The data in this Bulletin show the sodium in a range of common foods. Additionally they allow consumers to compare the amount of sodium in products purporting to be low in sodium with the ordinary product so that they may select their purchases according to their nutritional needs.

References

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Acknowledgements

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